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Migratory Patterns and Relative Abundance of Juvenile Toads and Salamanders in Experimentally Harvested Pine Forests

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The terrestrial life stages of aquatic-breeding amphibians are vulnerable to forest management practices that disturb ground and canopy cover adjacent to breeding sites. Furthermore, juvenile and adult amphibians may exhibit different behavioral and demographic responses to such habitat alteration. We examined the effects of forest removal on juvenile emigration and survival in large experimental arrays (n = 4) centered on seasonal wetlands at the Savannah River Site in South Carolina. In 2004, we manipulated the habitat in 4-ha quadrants adjacent to each wetland according to four randomly assigned treatments: clearcut with CWD removed (REM), clearcut with CWD retained (RET), partial harvest (PAR), and unharvested control (CON). In 2005-2006, we captured recently metamorphosed marbled salamanders (*Ambystoma opacum*) and eastern spadefoot toads (*Scaphiopus holbrookii*) in drift fences with pitfall traps located at the edge of each wetland and at 50 m, 100 m, and 150 m in each quadrant. Overall, we observed a sharp decline in recaptures of marked juveniles with increasing distance from the wetland. The relationship varied between species and among treatments, implying that there are complex interactions between species behaviors and costs to individuals in different habitats. During their initial emigration, both species exhibited nonrandom orientation. A higher proportion of *S. holbrookii* emigrated toward forest (CON and PAR treatments combined) than did *A. opacum* (0.69 and 0.49, respectively). Mean recapture rates of *S. holbrookii* in the terrestrial fences varied from 3.2% (REM) to 17.1% (PAR). Recapture rates of *A. opacum* varied from zero (CON) to 4.3% (RET). We also captured equal or greater numbers of marked and unmarked immature *Bufo terrestris*, *S. holbrookii*, and *A. opacum* in clearcuts versus forest. Enclosure studies conducted at the same sites, however, have shown that juvenile salamanders and toads have low survival rates in recent clearcuts.